Beryl Sin

PeopleSoft ID: 4522433

Problem Set 7

1. a. See ps7.py

b:

A collage of images of cars

Description automatically generated

1. a. See predict.py for implementation

b.



1. a. See nnCost.py for implementation

b.

A black and white screen with white text

Description automatically generated

1. See sigmoidGradient.py for implementation

A black screen with white text

Description automatically generated

1. a-c: See sGD.py for implementation

d. I used a value of 0.01 for the learning rate (alpha)

e.

A graph of a training cost

Description automatically generated

I used 1/52 of the training samples and a value of 0.1 for lambda, and ran sGD for 100 epochs.



A screen shot of a black screen

Description automatically generated

The accuracies are pretty high. It seems that a lambda value of 2 and an epoch value of 300 improves the accuracy of the labeling outcomes for both training and testing data. Though, unusually, there seems to be no errors after increasing the number of epochs to 300, so it seems that increasing the number of epochs has a larger effect on the accuracy of the nn. As lambda increases, the cost increases. As the number of epochs ran increases, the cost also increases. The best results were obtained with a lambda value of 0.1 and epoch number of 300 (lowest cost with highest accuracy).

Results using partitioned data and other epoch values:

A screenshot of a computer screen

Description automatically generated

Accuracy not being as high as expected may be a result of the network not being complex enough. It could also be that not enough epochs were used to train the neural network.